

"People's Science" and Development Theory

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ADORATION of Science, and 'fear of science' are the two responses to scientific and technological development prevalent in today's intellectual climate in India. Undoubtedly, I have risked enormous simplification in summarising so drastically the two sides of a heated, keenly participated debate.¹ I would not like to resolve the debate even if it were possible to do so, for, as I will show, this ongoing debate is serving a purpose which neither science nor fear of it could achieve without help from the other. My aim is to clarify some of the issues involved by examining people's science in terms of development theory.

WHAT IS PEOPLES SCIENCE?

In a way 'people's science' is a misnomer, for it does not refer to the science people have but rather to the goal of taking the scientist's science to the people. Its two main concerns are: (i) the knowledge and benefits of science ought to be equitably distributed and (ii) individuals working in science and technology establishments must understand the problems of the poor. Numerous voluntary groups² are working throughout the country to popularise these assertions. Many of these groups have institutionalised themselves: some are working within already established institutions. Although research literature on 'people's science' groups is meagre, programmes undertaken by them would take volumes to describe with any degree of analysis. This realisation alone suffices to justify the term 'movement' as a collective name for the activities of all the different science activist groups.

'People's science, is a growing movement, so its parametres are not yet fixed, nor has its attempt to assimilate new questions and solutions stopped. It is not easy to identify a coherent set of objectives within such a movement, especially when it consists of many independent groups and institutions. As one often sees in India, objectives are determined and clarified with reference to an adversary force. Thus, the discussions held at the Trivandrum convention of 'people's science' groups in February 1983 led to the recognition of two forces that the movement is opposed to. The first of these forces consists of god men who oppress the poor socio-culturally by perpetuating supernatural and superstitious beliefs; the second force is that of capitalist development which is "impoverishing the majority while enriching the few" (Jaffry *et al*, 1983) and is using science as a tool to manipulate people

These two hostile forces provide a context to look at the specific objectives of the people's science movement in a more detailed manner. The following is a list of objectives collected from bulletins and announcements of different science groups:

- (i) to popularise scientific knowledge among the masses;
- (ii) to develop a scientific outlook among the masses;
- (iii) to challenge the forces of supernaturalism, obscurantism and superstition;
- (iv) to equip the poor with knowledge and skills to analyse and articulate their demands and rights in an effective manner;
- (v) to re-assess modern Western science and technology which has grown mainly within the historical and economic context of colonialism;
- (vi) to re-evaluate non-Western or indigenous traditions in search of an alternative science and technology for our society;
- (vii) to develop appropriate technology and popularise it;
- (viii) to motivate professional scientists to work on problems that are relevant for the lives of the poor people;
- (ix) to involve science researchers, teachers, and students in mobilising the masses for structural change in society;
- (x) to build pressure on state structures to ensure that decisions are taken in a rational manner;
- (xi) to popularise self-reliance and the use of local resources in matters such as health, education, housing and industry;
- (xii) to develop a critical awareness regarding the methods used in the present system of education, and to develop an alternative method of education, especially science education, that would be relevant to children's own lives.

The four areas most popular among science action groups are: health, education, environment, and appropriate technology. Several agencies have involved themselves with programmes in all four areas, while others have specialised in one or two. In the case of a large number of agencies, it is difficult to describe

'education' as a separate area of action, for it subsumes all other action programmes. Nearly every 'people's science' group has undertaken programmes in some or the other sphere of social action that would come under the broad rubric of 'non-formal education'. A few agencies have developed a programme in science education within the formal or school system.

PARADIGMS IN DEVELOPMENT THEORY

"There can be no fixed and final-definition of development, merely suggestions of what development should imply in particular contexts" (Hettne, 1983; p 1), this realisation helps us escape the welter of claims and counter-claims made whenever the meaning of 'development' is under discussion. From this point of view, all attempts to theorise on the process of development can be seen as voices in an international rhetoric. Three distinct paradigms can be identified among these voices: 'modernisation', 'dependency', and alternative development.³

Modernisation theorists have derived their philosophical orientation from the well-established tradition of structural-functionalism in sociology. Supporters of modernisation typically choose urbanisation, literacy, break-up of the joint family, free enterprise, cultural secularisation, and social mobility as indicators of development. The key dialectic that the modernisation paradigm recognises is between 'tradition' and 'modernity'. This dialectic is perceived as an endogenous process, facilitated by the introduction of new ideas and their diffusion. As Hoogvelt (1976) explains

Because modernisation theories have viewed the total transformation, that is Westernisation, of developing countries as an inescapable outcome of successful diffusion of the Western economic/technological complex, by methodological reversal it is argued that a reorganisation of existing social and cultural as well as political patterns in anticipation of their compatibility with the diffused Western economic/technological complex may in fact facilitate the very process of this diffusion itself (p60)

The 'dependency' paradigm, emerging out of critiques of modernisation, proposed a fresh application of Marxist theorising on imperialism. Indian scholars like Dadabhai Naoroji, Rajni Palme-Dutt, and Ram Manohar Lohia had identified underdevelopment of the colony (i.e., India) as the basis of development in the coloniser's home (i.e., England) well before a theory of dependency was developed by Latin American economic historians. The historical linkage between the coloniser's home and the colony is now recognised by dependency theorists as the 'centre-periphery' relationship. The geography of the centre and the periphery is the basis of the international division of labour skills and knowledge. It stokes the poverty of the

periphery is a product of the centre's wealth, the periphery cannot overcome its poverty without altering the historically determined links with the centre. "Compared to the endogenism of the modernisation paradigm, the dependency approach in its stress on external factors or the impact of the world context appears almost as an antithesis. However, with respect to the content of development the difference is slight", according to Hettne (1983:p 46).

The content of development — of its process as well as its outcomes — is the focus of the third paradigm, namely 'alternative development', which has also emerged out of critiques of modernisation and its consequences. The intellectual background of this paradigm lies in Schumacher's "Small is Beautiful", Gandhi's emphasis on self-reliance and autonomy of small communities, and the concern for protection of the natural environment. Although none of these orientations is an altogether new discovery, their use as a basis for identifying a counterpoint to modernisation has been accepted relatively recently in the wake of superpower rivalry for similar gains, the draining and destruction of natural resources, and the escalation of misery among the poor throughout the world. According to the alternative development paradigm, the solutions to these problems can be found in structural reforms in favour of people's participation in decision-making, in increased independence of communities, and in physiocentric planning aimed at the development of appropriate technology.

'PEOPLES SCIENCE AND DEVELOPMENT'

Looking at 'people's science' in terms of the three paradigms of development theory allows us to identify diverse directions — including mutually contradictory directions — within the movement. Diversity of directions is a common feature of populist movements, and 'people's science' is no exception. Some of the contradictions in the aims of 'people's science' may well be within the limits of accommodation at present; recognising them now may help the movement to project into the future and to organise itself better.

The impact of modernisation is most pronounced in the emphasis on changing people's outlook and attitudes. A corollary of this emphasis is the counterposing of science against tradition, especially those aspects of tradition which involve faith in supernatural explanations and godmen. This dialectic between science and tradition has implications not simply for the movement's objectives but also for its methodology, especially its methodology of communication with people. Who are the 'people' with whom science activists want to communicate? A report (Vaidyanathan *et al* 1979) of the first all-India convention of science groups identifies 'people' as agricultural labourers, poor and

small peasants, rural artisans, craftsmen, and urban workers. The obstacles science activists face while communicating with these sections of society are no different from the obstacles any social agencies would face, including state-sponsored social work agencies and professional educators. These obstacles originate in the economic and educational distance between the 'people' and the agents of change, and in the pattern of links that dominant culture permits across the distance. Nothing hurts the possibility of communication more than the spirit of patronage in the agents of change towards those whom they want to change. The attitude of patronage takes many forms; in the professional educator it arouses the urge to 'enlighten' the child; in the social activist it becomes the mission of moulding people in the image of the moulder. If the moulder has something called a 'scientific temper', he decides that the people he is working for must also have this temper.

Scientific temper, or for that matter any other behavioural characteristic, cannot be made a universal requirement without incurring a serious danger of undermining both its meaning and the autonomy of those who do not share that meaning. Those who argue that the lack of a scientific temper is the root cause of India's problems should consider the possibility that they may be oversimplifying. Can any behavioural trait explain the rise or fall of the fortune of a group of people? 'People's science' activists who have so far been ready to follow the lead given by the godmen of modernisation should review their commitment to a simplistic explanation of the problems faced by the oppressed.

The emphasis on changing people's outlook from 'traditional' to 'scientific' is not consistent with some of the other objectives that can be identified in the 'people's science' movement. These other objectives are the ones that refer to the sociology of present-day scientific knowledge and the historical conditions under which much of it was produced! All science action groups are concerned about the concentration of scientific knowledge and technology in the powerful countries and in the hands of the local elite of the Third World countries. 'Peoples science' activists want a fair distribution of scientific knowledge and technology, and for such distribution to occur they feel that scientists would have to change their First World orientation in selecting research problems. Present day trends in problem-selection and dissemination of research are a product of the colonial heritage of international economy and education. Colonial exploitation has rendered today's Third World dependent on the First both materially and intellectually. The scientific community of the Third World is by and large a 'periphery' to the 'centre' which exists in the wealthy countries.⁴ This realisation on the

part of 'people's science' groups corresponds to the main thesis of the 'dependency' paradigm in development theory.

There is a conthict between the aim of liberating people from the bonds of tradition and the aim of liberating them from the bonds of colonial and neo-colonial relations. Unless 'traditions' are perceived as products of material circumstances and the pattern of relationships between the dominant and the dominated classes, the roots of so-called 'backward' behaviour cannot be understood. The modern developmental who merely points out that the poor are tradition-bound and backward unconsciously perpetuates the coloniser's view. Was not destruction of people's self-image a favourite strategy of the coloniser? The continued popularity of this view may be counterbalanced to some extent by research in pre-colonial science and technology in countries like India. It would be unfortunate if such valuable research is co-opted by those opposed to socio-economic change in order to promote the notion that modern science is Western, therefore alien, and that India must pursue its own science to fulfil its destiny. Questions such as 'which science is congenial to our culture?' or 'which science is less destructive?' are spurious; the important question is: *Which political and economic goals do we want science to serve?*

Research on indigenous traditions of science and technology would serve a useful purpose if it encourages and enables 'people's science' groups to materialise learning from people*. At present, such learning mostly consists of wishful thinking and vague, experiential gains. Since the recognition of Paulo Freire as an indispensable social action thinker, all kinds of agencies involved in social education have included "learning from people" as one of their operational principles. Yet, the evidence pointing towards specific learning acquired from rural people is meagre. The few attempts that have been made in this direction suggest that people may be less reluctant to teach what they know than scientists are to learn.⁵ If 'people's science' groups truly believe in learning from people, they would have to take up systematic programmes of research in specific areas of traditional knowledge; as a posture, learning from people' has already become a cliché just as much as 'grassroots', 'field', and 'testing' have become.

Emphasis on the content of change that one finds in the alternative development paradigm is reflected in the demand for the production and dissemination of appropriate technology that a large number of 'people's science' groups have either themselves voiced or have supported. This demand is consistent with another aspect of both 'people's science' movement and the alternative development paradigm, namely, that people's viewpoint and participation should play a key role in

decision-making by the state. The demand for scaling down of large-scale technology and scaling up of traditional technologies (McRobie, 1981) aims at enabling people to reclaim their independence from symbolic and material control by 'centres', both local and global. However superstitiously the prophets of modernisation may look at small-scale technology (for instance, in energy production), it certainly promises greater health for democratic institutions than modernisation could deliver,

SCIENCE AS SYMBOL

"it is very difficult for anybody to take an open anti-scientific attitude", says a brochure of the Kerala Sastra Sahithya Parishat while explaining the attitude of political parties towards the Parishat's work. Truly, science has become a symbol of all that is sacred and true for the modernised, and although few among the modernised actually throw the unscientific out of their lives,⁶ no one who is active in public life - from local to the highest level - fails to appreciate the point that science is a useful god. and further that this god can be kept pleased with lip-service alone. The holy status science is accorded by public figures makes it a fine tool for the social activist. It renders the activist almost as immune to criticism and persecution as would the programme of a local council for the protection of cows or the megaphonic recital of the Ram Chant Manas, The security that science enjoys in contemporary India is matched only by the security that religion enjoys. What use have the science activist groups made of this security?

By accepting the symbolic value of science as its major political value, 'people's science' groups may find it possible to relent in their demand for the dissemination of the scientific temper among the masses as a pre-condition for social transformation. On the other hand, they may find it more necessary to toughen up their demand for the use of scientific information and procedures in the method of decision-making and implementation of decisions by the ruling elite. They may even be tempted to objectively probe the social and political dimensions of the examples of the Scientific temper that scientists provide when they underplay the hazards of nuclear energy, DDT, and overdrugging. The socio-political behaviour of scientists and the science worship of powerful bureaucrats and politicians deserve harsher scrutiny than the temper of the oppressed masses.

The real use of a scientific temper and method for the study and transformation of society would perhaps be found in a different quarter than where science activists and their mentors have been used to applying it. The maverick editorial of the Independence Day (1983) special of *Yojana*, a government publication, ends by saying that the scientific temper will enable our masses to "comprehend what really underlies the cliches 'Unity in Diversity' and 'Tolerance Our Heritage' ". The political acumen and sense of

political reality required to probe such cliches is rare among torch-bearers of the scientific temper. In the quicksilver world of Indian politics, line of rhetoric and alliances shift before sincere individuals in the academic fringe may always want to take note of. Today, science is the door through which oppressive and unwanted technologies and militarist research penetrate in the Third World with the help of its local elites. Consider, for instance, the current threat posed to the poor Indian education system by the powerful campaigners of micro and video technology. Their voice is heard and their products will be purchased in the name of science. The well-meaning propagators of science and its tempers are politically out-of-date. They have been outwitted by revivalists at home and by the corporations abroad. The cause of science is badly in need of a new elite. The 'peoples science' movement will serve a historical role if it leads to the emergence of a new elite among the allegedly backward.

Notes

- 1 The current debate can be pursued by looking first at the "Statement on Scientific Temper" (*Mainstream*, July 25, 1981), and then at the articles published in the August 29, October 10, November 14, and December 20, 1981 issues of *Mainstream*; Anil Sadgopal's "Between, Question and Clarity" (*Science Today*, October 1981); *PPST Bulletin*, March 1982; my "Science Education and Development" (CSDS, New Series No 2, 1983); and the August 15, 1983 issue of *Yojana*. This is by no means an exhaustive list of references.
- 2 For a listing see Kannan (1979) and Jaffry et al (1983).
- 3 Along with Hettne (1983), see Foster-Carter (1978), Kitching (1982), and Roxborough (1979).
- 4 A recent article that helps us understand the sociology of dissemination and recognition of science research is "Science in the Third World" by Eugene Garfield

in *Science Age*, October-November 1983.

- 5 See "When the Search Began" in Bang and Patei (eds) "Health Care, Which Way to Go?" (Pune: Medico Friends Circle, 1982). Also see Vasantha Surya's "This 'Juggernaut' of Establishment Science" *inrojana* (Independence Day Special, 1983).
- 6 Apart from numerous examples of 'un-scientific' behaviour by Indian scientists and advocates of the scientific temper that appear in Indian newspapers and some of which have been referred to in *Yojana* (August 1983), I find a photograph published in the *International Herald Tribune* of September 12, 1983 of great interest. This photograph is taken in Asia's technological giant, namely Japan. It shows a throng of Japanese men standing beside their newly purchased cars waiting outside a temple to get their cars purified.

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